

AMENDMENTS TO THE DRAWINGS

Please substitute the attached four sheets of replacement drawings for the drawings originally filed.

REMARKS/ARGUMENTS

Claims 1-37 stand rejected in the outstanding Official Action. Claims 1, 5, 13, 14, 15, 20, 21 and 27 have been amended and therefore claims 1-37 remain in this application.

While Applicants note that the Examiner indicated PTO acceptance of the formal drawings filed May 10, 2005 in the Official Action of January 29, 2008, the Examiner has now raised objections to those drawings. Applicants have considered the Examiner's concerns and have included for replacement sheets of formal drawings attached hereto.

The Patent Office withdrawal of the obviousness-type double patenting rejection as noted on page 2, section 2 of the Official Action is very much appreciated.

On page 2, section 3 of the Official Action, the Examiner has provided a copy of the specification on record and Applicants verify that it is the same document that Applicants have been referring to in the previous communications.

The Examiner continues to maintain, e.g., page 3, section 5, that the specification of a national phase entry of a PCT International application somehow must meet U.S. standards ("the specification currently on record neither complies with the WIPO/PCT requirement nor the U.S. standards on format" section 5, page 3 of the office action). As has been previously pointed out, this is not correct and the fact that U.S. format requirements were detailed in a previous Office Action is of no import, as the U.S. PTO may not insist upon format standards in accordance with U.S. practice with respect to PCT International applications entering the national phase.

However, Applicants have amended the first page of the specification to include the title, as it does not identify the title of the invention as set out in the PCT application. The inclusion of this amendment is believed to obviate all objections to the format of the pending specification without the need for Applicants to include headings and subheadings which, as confirmed by

SPE Chowdhury and as reported on page 3 of the Request for Reconsideration filed October 29, 2008, are indeed not required.

Interview conducted January 12, 2009

The Examiner's recitation of the substance of the interview is essentially correct, in that Applicants' undersigned representative pointed out that the subject matter of the claimed invention was not anticipated or rendered obvious in view of the Tiao patent (U.S. Patent 6,318,863) because it failed to teach the elements of Applicants' claimed invention. While it is noted that in the Official Action the Examiner argues that both the Examiner and SPE Chowdhury are of the belief that claim 1 was clearly taught by the Tiao patent, it is noted that the Tiao patent is no longer cited as an anticipatory reference (indeed, it is only recited as a secondary reference in an obviousness rejection of dependent claims). This would appear to confirm the undersigned's contention during the interview that Tiao simply does not anticipate or render obvious the independent claims.

The Examiner raises objections to the specification on page 7, section 10 and the insertion of the title as noted above is believed to obviate the rejection.

On page 7, section 11 of the Official Action, the Examiner correctly notes that reference character 68 is used in two occurrences and the reference to the projection lens has been changed to read "projection lens 72" in both Applicants' specification and in Figure 6.

On page 8, section 12 of the Official Action, the Examiner requests that numerous aspects of the claims, which are not normally susceptible to illustration, be illustrated in this application. Applicants have attempted to amend the drawings and provides marked-up sheets of drawings along with new formal drawings including the amendments. In section 12a, the first

distance and second distance is illustrated in Figure 1 and discussed in Applicants' specification as 7 and 9, respectively. The reflection axes P and Q as discussed in claim 23 are now illustrated and identified in Figure 3 and the accompanying discussion in the specification. The light source not symmetric about reflection axes as recited in claim 23 is also illustrated in Figure 3 and the asymmetry of the light source is reflected in the images shown.

In section 12d, the mask having various transmissive characteristics is shown as masks 92a, b and c in Figure 9. In section 12e, the axes of reflection of the light guide are also shown in Figure 3 with the axes designated P and Q. In section 12f, the light source 80 is shown in Figure 8. In section 12g, the mask with modulator is shown in Figure 9 as masks 92a, b and c.

In section 13, Figures 5, 6 and 7 are objected to as lacking labels or reference numbers. Reference numbers 55, 65 and 75 have been added to each of Figures 5, 6 and 7, thereby clearly labeling the light images illustrated in Figures 5-7. In section 14, projection lens 72 has been indicated in Figure 6, thereby obviating the objection.

Applicants have included copies of the amended sheets of drawings along with replacement sheets of drawings which are believed to overcome the Patent Office objection. Any further objection to the formal drawings is respectfully traversed.

In section 15 on page 10 of the Official Action, the Examiner objects to claim 13 as somehow being of "improper dependent form." Claim 13 depends from claim 1 and contains a further limitation of claim 1, i.e., claim 13 requires that the "array of images projected towards the scene have a common point of origin." Because claim 1 specifies a light source but does not require that the light source have a common point of origin, it covers both possibilities whereas claim 13 further limits claim 1 to the single possibility of having a common point of origin. For example, the light source in claim 1 could be a plurality of point light sources and meet the

requirements of claim 1. Claim 13 specifies that the array of images projected towards the scene have a common point of origin. This limitation indicates that one method of providing a “common point of origin” is to use a single point source of light or optics which provide a single point source of light. Thus, claim 13 properly limits claim 1 from which it depends and any further objection thereto is respectfully traversed.

Notwithstanding the PTO objection to claim 13, applicants have further limited the claim in the above amendment.

Claims 5, 14, 15, 20, 21 and 27 stand rejected under 35 USC §112 (second paragraph) as being indefinite. In section 18, the Examiner correctly objects to claim 5 and this claim has been amended to delete the second and narrower range.

In section 19 on page 11, the Examiner objects to claim 14. Claim 14 has been amended to delete the term “preferable.” In section 20, page 11, the Examiner also objects to claim 14 with respect to the word “expected” and this term has been deleted in the above amendment.

In section 21, page 11, the Examiner objects to claim 15 and the use of the phrase “may be.” Applicants have amended claim 15 to read “is” thereby obviating any further objection.

In section 22 on page 11, the Examiner objects to claim 20 and the use of the phrase “can be.” Applicants have amended the claim to read “are” thereby obviating any further objection.

In section 23 bridging pages 11 and 12, the Examiner objects to the language in claim 21. The language in claim 21 has been amended to read “wherein at least one light source emits light at a wavelength different from the wavelength of another light source.” This language is believed to obviate any further objection to claim 21.

In section 24 on page 12, claim 27 has been rejected based upon the typographical error “may is adapted.” Applicant have amended the claim to read “wherein the light source is adapted”

In view of the above amendments to claims 5, 14, 15, 20, 21 and 27, all bases for rejection have been obviated.

Claims 1-3, 6, 9, 16-18 and 21-23 stand rejected under 35 USC §102(b) as anticipated by Kuchitsu (JP 62007019). The Court of Appeals for the Federal Circuit has noted in the case of *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) that “[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.”

In order to determine whether a prior art reference has all elements and all interrelationships between elements specified in the claim, the Examiner must first properly construe the claim. Each of Applicants’ claims recite a “structured light” generator for illuminating a scene. Applicants have amended claim 1 to further recite that the structured light generator is “such that light reflected from the scene can be imaged to provide range information” as further explanation for how and what the structured light generator is useful for. However, the fact remains that Applicants’ invention is a particular type of “structured light” generator and the Examiner must construe the claim properly, i.e., it is limited to structured light generators.

During the telephone interview with the Examiner and his Supervisor, it became clear that the Examiner did not appreciate that “structured light” (and its generation) is a well-known term of art to those having ordinary skill in the art in the present invention. Applicants made this argument, but the Examiner suggested that there was no such definition. Applicants include

herewith a copy of http://en.wikipedia.org/wiki/Structured_light which includes a definition of “structured light” (“the process of projecting a known pattern of pixels (often grids or horizontal bars) on to a scene”) which is consistent with the term as used in the present specification and claims. The PTO’s own recognition of “structured light” as a term of art is also noted on page 1, lines 24-29 in the discussion of U.S. Patent 6,377,353.

Finally and most importantly, Applicants’ specification includes a definition of structured light generator, i.e., “as used in this specification the term structured light generator shall be taken to mean a source which projects a plurality of distinct areas of light towards a scene.” (Specification, page 2, lines 10-12). This definition is consistent with the Wikipedia definition of structured light as “projecting a known pattern of pixels (often grids or horizontal bars) on to scene.” Thus, the term “structured light generator” as claim terminology clearly serves to limit the claim and in this instance limits the manner in which the components are combined. Thus, under PTO practice, this preamble limitation must be considered by the Examiner when considering prior art.

Turning to the Kuchitsu reference, there is no disclosure of any structured light generator in the Kuchitsu reference. Instead, Kuchitsu describes a device for outputting a complex and constantly changing pattern for use in the entertainment field of signs and games. The device produces an output of moving patterns (the direct opposite of a “structured light” generator) and one of ordinary skill in the art reviewing Kuchitsu will appreciate that these patterns vary randomly with time. In fact, the Kuchitsu reference at numerous instances specifies that the patterns are “extremely rich in changes.”

The present invention, as noted above, is related to a structured light generator, i.e., the projection of a known pattern of pixels onto a scene which is especially beneficial for calculating depth and surface information of objects in the scene.

The patterns in Kuchitsu are not “known” and are continuously changing in an unpredictable manner. Therefore, Kuchitsu teaches an unstructured light generator which would be the direct opposite of the claimed structured light generator. Accordingly, Kuchitsu clearly leads those of ordinary skill in the art away from the claimed invention. Thus, the Examiner is incorrect in his analysis of the present independent claims in his suggestion that Kuchitsu in Figure 1 illustrates a structured light generator because Kuchitsu actually leads one of ordinary skill in the art away from the claimed combination of elements.

In view of the above, claims 1, 2, 3, 6, 9, 16-18 and 21-23 cannot be anticipated by Kuchitsu because no structured light is generated in Kuchitsu because the disclosed light pattern is constantly changing. Therefore, it would not be useful in determining depth and/or surface information from objects in the scene and clearly avoids the definition of “structured light” as set out both in Applicants’ specification and as would be obvious to those of ordinary skill in the art in view of the Wikipedia definition noted above and attached hereto.

Claims 14, 15, 25-34, 36 and 37 stand rejected under 35 USC §103 as being unpatentable over Kuchitsu. Inasmuch as claims 14, 15, 25-34, 36 and 37 all ultimately depend from claim 1, the above comments distinguishing claim 1 from the Kuchitsu reference are herein incorporated by reference. Because Kuchitsu teaches away from a structured light generator, it clearly does not have the combination of elements set out in Applicants’ independent claim 1 and therefore cannot serve as the basis for a *prima facie* case of obviousness. Moreover, because Kuchitsu teaches a time varying location of spots of light, it teaches away from the structured light

generator claimed. The fact that Kuchitsu teaches away from the claimed invention rebuts any *prima facie* case of obviousness made. As a result, claims 14, 15, 25-34, 36 and 37 cannot be obvious in view of Kuchitsu.

The Examiner's allegation that he takes "official notice" that the features of claims 25-34 are either taught by Kuchitsu or are obvious variations thereof is respectfully traversed, since the Examiner has provided no evidence to support his conclusion. In fact, as noted above, Kuchitsu clearly teaches away from Applicants' claimed combination of elements, thereby obviating any possibility of official notice. Should the Examiner believe he is entitled to rely upon official notice, in accordance with the MPEP Section 2144.03, Applicants respectfully traverse the Examiner's contention and requires the Examiner to provide documentary evidence to support his conclusion (see MPEP Section 2144.04(c)).

In view of the numerous instances of the Examiner's reliance upon "official notice" in view of various aspects of the Kuchitsu teaching, Applicants' traverse each and every one of the Examiner's official notices because they are completely unsupported by the Kuchitsu reference and in fact Kuchitsu actually teaches away from each one of the Examiner's allegations.

In section 44 of the Official Action, claim 24 stands rejected under 35 USC §103 as unpatentable over Kuchitsu in view of Tarsa (U.S. Patent 6,350,041). Again, because claim 24 ultimately depends from claim 1 and because Kuchitsu teaches away from the subject matter of claim 1, there is not only no *prima facie* case of obviousness, but Kuchitsu rebuts any *prima facie* case of obviousness by teaching away from the claimed invention. The above discussion of claim 1 and the Kuchitsu reference is herein incorporated by reference.

In section 46, claims 4, 7 and 19 stand rejected under 35 USC §103 as unpatentable over Kuchitsu in view of Tiao (U.S. Patent 6,318,863). Again, the Examiner's reliance upon the

Kuchitsu reference is misplaced, as it fails to teach any structured light generator and inasmuch as claims 4, 7 and 19 all depend ultimately from claim 1, the above comments distinguishing claim 1 from the Kuchitsu reference are herein incorporated by reference. The Examiner does not allege that Tiao teaches a structured light generator and therefore even if Tiao and Kuchitsu are combined, they do not disclose the subject matter of claim 1 or claims 4, 7 and 19 ultimately dependent thereon. Moreover, because Kuchitsu teaches away from the claimed invention, this teaching away legally rebuts any *prima facie* case of obviousness and any further rejection of claims 4, 7 and 19 under 35 USC §103 is respectfully traversed.

In section 51, claims 10-13 stand rejected under 35 USC §103 as unpatentable over Kuchitsu/Tiao further in view of Tarsa. Inasmuch as claims 10-13 ultimately depend upon claim 1, the above comments regarding the Kuchitsu reference by itself as well as the Kuchitsu/Tiao combination of references are herein incorporated by reference. It is noted that the Examiner does not allege that Tarsa teaches a structured light generator and Tarsa is not alleged to supply the features missing from claim 1 in the Kuchitsu/Tiao references.

Accordingly, even if Kuchitsu, Tiao and Tarsa were combined, they would not serve as a legal basis for a *prima facie* case of obviousness of claims 10-13. Moreover, because Kuchitsu specifically teaches away from the claimed invention, this adverse teaching clearly rebuts any *prima facie* case of obviousness made. Accordingly, there is no legal basis for rejection of claims 10-13 over the Kuchitsu/Tiao/Tarsa combination.

In section 56, claims 5, 8 and 20 stand rejected under 35 USC §103 as unpatentable over the Kuchitsu/Tiao combination further in view of Kurosawa (U.S. Patent 6,373,026). Because each of these claims depend from independent claim 1, the above comments distinguishing claim 1 from both Kuchitsu by itself and the Kuchitsu/Tiao combination are herein incorporated by

reference. The Examiner does not allege that Kurosawa supplies the missing teaching of a structured light generator and therefore even if Kuchitsu, Tiao and Kurosawa were combined, they do not provide a legal basis for rejection under 35 USC §103, i.e., there is no *prima facie* case of obviousness. Furthermore, because Kuchitsu teaches away from a structured light generator, this adverse teaching legally rebuts any *prima facie* case of obviousness made. Accordingly, there can be no legal basis for rejecting claims 5, 8 and 20 under 35 USC §103 over the Kuchitsu/Tiao/Kurosawa combination.

In section 58, claim 35 stands rejected under 35 USC §103 as unpatentable over the Kuchitsu/Tiao combination further in view of Shimomukai (U.S. Patent 5,757,548). Inasmuch as claim 35 ultimately depends on independent claim 1, the above comments distinguishing claim 1 over the Kuchitsu reference by itself and the combination of Kuchitsu and Tiao are herein incorporated by reference. The Examiner does not allege that Shimomukai teaches a structured light generator and thus even if all three references were combined, they would not disclose the subject matter of claim 1 or claim 35 which is ultimately dependent thereon. Moreover, because Kuchitsu teaches away from a structured light generator, this adverse teaching legally rebuts any *prima facie* case of obviousness even if one were made. Accordingly, there is simply no support for the contention that claim 35 is obvious in view of the Kuchitsu/Tiao/Shimomukai combination.

In sections 60 and 61 of the Official Action, the Examiner suggests that he has made fact statements based upon his own personal knowledge and these serve as the basis for “official notice” in the Official Action. Applicants has seasonably challenged each and every one of these alleged “official notice” actions because the Examiner clearly has ignored the claim language requiring a “structured light” generator and has ignored the adverse teaching in the Kuchitsu

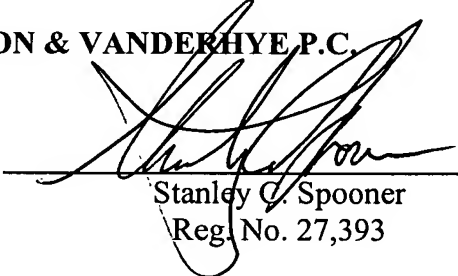
reference which is a non-structured random light generator. Given this misapprehension of the Kuchitsu reference, it is incumbent upon the Examiner to provide some evidentiary support for each of his many "official notice" allegations, as none are believed to be supported in the art.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-37 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is respectfully requested to contact applicant's undersigned representative.

Respectfully submitted,

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Attachments:

Replacement Sheets
Annotated Sheets Showing Changes
Structured Light http://en.wikipedia.org/wiki/Structured_light